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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/986,804	11/13/2001	Hitoshi Tsuboi	1272.C0488	6112
5514	7590	04/27/2004	EXAMINER	
FITZPATRICK CELLA HARPER & SCINTO 30 ROCKEFELLER PLAZA NEW YORK, NY 10112			NGUYEN, LAM S	
			ART UNIT	PAPER NUMBER
			2853	

DATE MAILED: 04/27/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/986,804	Applicant(s) TSUBOI ET AL.	
	Examiner LAM S NGUYEN	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-15,17-29,31-39,42 and 44-52 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-15,17-29,31-39,42 and 44-52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 November 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 3-6, 8, 10-11, 13-15, 17-20, 22, 24-25, 27-29, 31-34, 36, 38-39, 42, 44-47, 49, 51-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lund et al. (US 5659342) in view of Smith et al. (US 4791435).

Lund et al. disclose an ink jet printing apparatus capable of performing a preliminary ejecting operation that does not contribute to printing (in term of “purging”) (Abstract), said apparatus comprising:

a print head having an ejecting portion and having a driver (column 2, line 14-16: a corresponding driver for causing the firing of selected nozzles in the purging step) for driving an amount of ink to be ejected through said ejecting portion, wherein during printing an amount of ink passing through said ejecting portion, per unit of time or optical density obtained from a pigment concentration of ink through said nozzle (**Referring to claim 15**) varies depending on the length of time during which printing is not executed (column 2, line 41-46: the combination of small nozzles and quick drying ink leaves the printheads susceptible to clogging. This causes the amount of ink (or optical density) ejected through a nozzle varying dependently on the length of time during which printing is not executed),

wherein said preliminary ejecting operation is performed so that an amount of ink

passing through said nozzle is decreased below a normal value (column 6, line 52-54: suggesting that decreasing the drop size to improve the ability of hiding of purging drops on the page), except when said print head is disposed at a predetermined position (column 6, line 61-67: suggesting that returning the printhead to a spittoon for handling large amounts of purged ink).

Lund et al. do not disclose wherein one or two ejections are performed through said ejecting portion in one preliminary ejection operation.

Smith et al. disclose a service operation in a thermal inkjet printhead wherein two preliminary ejections are performed through a nozzle in one preliminary ejection operation to clear viscous plugs from the nozzle and control the temperature at a desired value (column 1, line 22-27).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the service operation in the printing apparatus disclosed by Lund et al. such that one or two preliminary ejections are performed through a nozzle in one preliminary ejection operation as disclosed by Smith et al. The motivation of doing so is to clear viscous plugs from the nozzle and provide an warm up interval to achieve a printhead temperature at or near a desired temperature for printing purposes as taught by Smith et al. (column 1, line 22-27).

Lund et al. also disclose the following claimed inventions:

Referring to claims 3, 17, 31, 44: wherein said preliminary ejecting operations performed when said amount of ink passing through said ejecting portion or when said optical density is decreased below a normal value (column 1, line 47-51: spitting is needed when nozzles

are partially blocked that decreases an amount of ink passing through the nozzles below a normal value).

Referring to claims 4, 18, 32, 45: wherein said preliminary ejecting operation is performed between the time when said flow of ink passing through said ejecting portion or when said optical density starts to decrease below said normal value and the time when said flow of ink or when said optical density recovers to said normal value (column 1, line 47-51: spitting is needed when nozzles are partially blocked that decreases an amount of ink passing through the nozzles below a normal value. Because after the spitting is done, the opening of nozzles is clear, the amount of ink passing through the nozzles is recovered to a normal value).

Referring to claims 5, 19, 33, 46: wherein said preliminary ejecting operation is performed on a print medium (Abstract).

Referring to claims 6, 20, 34, 47: wherein said preliminary ejecting operation is performed on said print medium only if dots formed on said print medium may be unnoticeable compared to a printed image, and wherein said preliminary ejecting operation is performed on an object other than said print medium if dots may be noticeable (column 5, line 1-3, column 7, line 12-15, and column 6, line 58-67).

Referring to claims 8, 22, 36, 49: wherein said preliminary ejecting operation is performed when a predetermined time has elapsed after a last ejection, said predetermined time including time during which said amount of ink passing through said nozzle is decreased significantly (column 5, line 66 to column 6, line 3).

Referring to claims 10, 11, 24, 25, 38, 39, 51, 52: wherein said print head has a plurality of nozzles, and wherein said predetermined time is determined for each of nozzles and wherein

said predetermined time for each of said nozzles is corrected using dithering, error diffusions, or random numbers so that a dot pattern formed during said preliminary ejecting operation for said plurality of nozzles is unnoticeable compared to a printed image (column 7, line 12-15).

Referring to claims 13, 27: wherein said print head includes an electrothermal converting element, said print head ejecting ink using thermal energy generated by said electrothermal converting element (column 3, line 31-32).

Referring to claims 14, 28: wherein said print head includes a piezoelectric element, said print head ejecting ink using mechanical energy generated by said piezoelectric element (column 3, line 32-34).

Referring to claim 15: using ink containing a pigment as a color material (column 1, line 35-45).

2. Claims 9, 12, 23, 26, 37, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lund et al. (US 5659342) in view of Smith et al. (US 4791435), and further in view of Fujii (US 6299277).

Lund et al., as modified, disclose the claimed invention as discussed above and also disclose wherein said predetermined time is determined depending on a temperature condition of said printing apparatus (column 5, line 26-35). However, Lund et al., as modified, do not disclose that said predetermined time is determined depending on a humidity condition of said printing apparatus, a table used to determined said predetermined time and ejecting numbers for said preliminary ejecting operation, and a control device for controlling said predetermined ejecting operation, said control device using said table to perform said predetermined ejecting operation (**Referring to claims 12, 26**).

Fujii discloses that a predetermined time of a recovering process is determined depending on a humidity condition of said printing apparatus (column 3, line 53 to column 4, line 10), a table used to determine said predetermined time and ejecting numbers for said preliminary ejecting operation, and a control device for controlling said predetermined ejecting operation, said control device using said table to perform said predetermined ejecting operation (column 4, line 5-16: a conversion table for converting the relative humidity to the evaporation rate of water from the ink. Based on the evaporation rate, the suitable timing is determined).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the ink jet printing apparatus disclosed by Lund et al., as modified, such that including the conversion table for converting the relative humidity to the evaporation rate of water from the ink for determining the predetermined time to perform the recovering operation as disclosed by Fujii. The motivation of doing so is to be able to determine suitable timing which fulfills necessary and sufficient conditions in executing the removal of thickened ink adhering the printhead in order to enable the ink jet printer to flexibly cope with changes in the environment as taught by Fujii (column 4, line 5-10).

Response to Arguments

Applicant's arguments filed on 02/09/2004 have been fully considered but they are not persuasive.

Regarding to the argument on page 15: The applicant argued that neither Lund et al. nor Smith discloses "one or two ejections performed in one preliminary ejection operation". However, the applicant acknowledged that Smith disclosed at least one ejection operation to clear viscous plugs and to warm up the printhead. In addition, Smith teaches that this ejection

operation is performed prior to printing operation. Therefore, based on the claim language “a preliminary ejecting operation that does not contribute to printing” and “one or two ejections”, Smith’s disclosure reads on the claim language of the claimed invention.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2853

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
April 20, 2004

Hai Pham

HAI PHAM
PRIMARY EXAMINER